

**HUBUNGAN DI ANTARA AMALAN PENGURUSAN
KESELAMATAN DAN TINGKAHLAKU KESELAMATAN: SUATU
KAJIAN DI PETRONAS FERTILIZER SDN BHD**

ROZANARIAH BINTI MOHD SANI

**MASTER OF HUMAN RESOURCE MANAGEMENT
UNIVERSITI UTARA MALAYSIA**

[2014]

**HUBUNGAN DI ANTARA AMALAN PENGURUSAN
KESELAMATAN DAN TINGKAHLAKU KESELAMATAN: SUATU
KAJIAN DI PETRONAS FERTILIZER SDN BHD**

Oleh:

ROZANARIAH BINTI MOHD SANI

**Tesis Diserahkan kepada
Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
bagi Memenuhi Keperluan Sarjana Pembangunan Suber Manusia
2014**

KEBENARAN MERUJUK

Kertas projek ini dikemukakan sebagai memenuhi keperluan bagi pengurniaan Sarjana Pengurusan Sumber Manusia , Universiti Utara Malaysia (UUM). Saya dengan ini bersetuju membenarkan pihak perpustakaan Universiti Utara Malaysia mempamerkannya sebagai bahan rujukan umum. Saya juga bersetuju bahawa sebarang bentuk salinan sama ada secara keseluruhan atau sebahagian daripada kertas projek ini untuk tujuan akademik perlulah mendapat kebenaran daripada Penyelia Kertas Projek atau Dekan Othman Yeop Abdullah Graduate School of Business terlebih dahulu. Sebarang bentuk salinan dan cetakan bagi tujuan komersil adalah dilarang sama sekali tanpa kebenaran bertulis daripada penyelidik. Pernyataan rujukan kepada penulis dan Universiti Utara Malaysia perlulah dinyatakan jika rujukan terhadap kertas projek ini dilakukan.

Kebenaran untuk menyalin atau menggunakan kertas projek ini sama ada secara sebahagian atau sepenuhnya hendaklah dipohon melalui:

Dekan Othman Yeop Abdullah Graduate School of Business

Universiti Utara Malaysia

06010 UUM Sintok Kedah Malaysia

ABSTRAK

Kadar kematian akibat daripada kemalangan di tempat kerja sangat membimbangkan bukan sahaja di Malaysia, malah turut berlaku di seluruh dunia. Dianggarkan lebih daripada 2.3 juta orang di seluruh dunia ini terkorban akibat daripada kemalangan di tempat kerja. Malah, di Malaysia sahaja, lebih 50 ribu kemalangan dilaporkan berlaku pada tahun 2010 dan 22 ribu daripadanya adalah melibatkan kehilangan nyawa. Dalam mencapai sasaran negara untuk meletakkan Malaysia sebagai sebuah Negara Perindustrian Maju menjelang 2020, pelbagai usaha perlu dilaksanakan bagi membendung masalah ini daripada terus berlaku kerana ianya akan menyebabkan wujudnya ketidakpercayaan di kalangan pelabur asing untuk terus melabur di Negara Malaysia. Salah satu faktor yang dilihat memberikan kesan kepada peningkatan kadar kemalangan di tempat kerja adalah disebabkan oleh amalan pengurusan keselamatan yang tidak terurus. Kajian ini dibuat bertujuan untuk mengkaji amalan pengurusan keselamatan yang di amalkan di Petronas Fertilizer (Kedah) Sdn Bhd terhadap tingkahlaku keselamatan pekerja. Satu sampel telah diambil secara rawak yang terdiri daripada 118 orang pekerja daripada 625 orang pekerja secara keseluruhan. Hasil kajian menunjukkan wujud hubungan yang signifikan antara semua item di dalam amalan pengurusan keselamatan dengan tingkah laku selamat. Didapati, komitmen pengurusan mempunyai perhubungan signifikan yang tertinggi dengan tingkah laku selamat. Ini diikuti oleh latihan keselamatan, dasar promosi keselamatan, komunikasi dan maklumbalas keselamatan, peraturan dan prosedur keselamatan dan penglibatan pekerja dalam keselamatan.

Katakunci: Komitmen Pengurusan, Penglibatan Pekerja, Latihan Keselamatan, Komunikasi dan Maklumbalas Keselamatan, Peraturan dan Prosedur Keselamatan, Dasar Promosi Keselamatan dan Tingkahlaku Keselamatan.

ABSTRACT

The rate of deaths resulting from accidents in the workplace is very alarming, not only in Malaysia, but also occurs worldwide. It is estimated that more than 2.3 million people worldwide have died from workplace accidents. In fact, in Brazil alone, over 50 thousand accidents were reported in 2010 and 22 thousand of whom are involved in loss of life. In order to achieve the national target to position Malaysia as an Advanced Industrial Countries in 2020, efforts should be undertaken to prevent these problems from happening that it will result in a lack of confidence among foreign investors to invest in Malaysia. One of the factors that can have an impact on increasing the rate of workplace accidents are caused by safety management practices are not neglected. The purpose of this study is to investigate the safety management practices that are practiced at Petronas Fertilizer (Kedah) Sdn Bhd towards their workers. A random sample was taken which consists of 118 workers from 625 workers overall. The results showed a significant relationship exists between all items in safety management practices with safety behaviour. Management commitment has the highest significant relationships towards safety behaviour. This was followed by safety training, policy and safety promotion, communication and feedback, regulatory and safety procedures and employee engagement in safety.

Keywords: Commitment Management, Employee Engagement, Safety Training, Communication and Feedback in Safety, Regulatory and Safety Procedures, Policy and Safety Promotion Safety Behaviour.

PENGHARGAAN

Bismilahirrahmanirrahim.....

Segala puji bagi Allah yang telah memberikan saya ruang dan peluang untuk saya menyiapkan tesis ini dengan jayanya tanpa sebarang gangguan. Segala kekuatan, kesabaran dan keupayaan telah saya curahkan dalam menyiapkan tesis ini. Ucapan terima kasih yang tidak terhingga kepada semua pihak yang telah banyak menghulurkan sokongan, bantuan, kerjasama dan nasihat sama ada secara langsung atau tidak di dalam menjayakan kajian ini. Penghargaan ini saya tujukan khusus untuk Dr. Fadzli Shah b. Abd Aziz , selaku Penyelia Projek Sarjana ini di atas bimbingan, nasihat dan tunjuk ajar yang membina sepanjang proses pelaksanaan projek dan penulisan ini dilakukan. Tidak lupa juga kepada Pegawai Sumber Manusia Petronas Fertilizer (Kedah) Sdn Bhd iaitu Pn. Norasma bt Hassan yang telah banyak membantu dalam memberikan maklumat berkaitan projek ini. Tidak dilupakan kepada rakan-rakan seperjuangan di dalam program Sarjana Pengurusan Sumber Manusia di atas dorongan, tunjuk ajar dan nasihat kalian sepanjang penulisan tesis ini. Akhir sekali, saya ingin merakamkan ribuan terima kasih yang tidak terhingga kepada ibubapa saya, En. Mohd Sani Ibrahim dan Pn. Rohani Mohd Nor yang selama ini banyak memberikan kata-kata semangat dan perangsang kepada saya dalam menyiapkan tesis ini.

Sekian.

KANDUNGAN

SENARAI KANDUNGAN SURAT

MUKA

TAJUK	i
PERAKUAN KERTAS KERJA	ii
KEBENARAN MERUJUK	iii
ABSTRAK	iv
ABSTRACT	v
PENGHARGAAN	vi
ISI KANDUNGAN	vii
SENARAI JADUAL	x
SENARAI RAJAH	xi
BAB SATU PENGENALAN.....	1
1.1 Latar Belakang Kajian	1-4
1.2 Latar Belakang Kajian	5-6
1.3 Latar Belakang Organisasi	6-7
1.4 Pernyataan Masalah	7-10
1.5 Persoalan Kajian	10-11
1.6 Objektif Kajian	11-12
1.7 Skop Kajian	12
1.8 Kepentingan Kajian	12-13

1.9 Pengorganisasian Bab	13-14
BAB DUA	
KAJIAN LITERATUR.....	15
2.1 Pengenalan	15
2.2 Tingkahlaku Selamat	15-17
2.3 Amalan Pengurusan Keselamatan	17-18
2.3.1 Komunikasi Pengurusan	18
2.3.2 Latihan Keselamatan	19
2.3.3 Penglibatan Pekerja dalam Aspek Keselamatan	19
2.3.4 Komunikasi dan Maklumbalas dalam Keselamatan	20-22
2.3.5 Peraturan dan Polisi Keselamatan	22-23
2.3.6 Dasar Promosi Keselamatan	23-24
2.4 Kajian Empirikal (Amalan Pengurusan Keselamatan Dan Tingkahlaku Keselamatan)	24-25
2.5 Teori	25-27
BAB TIGA	
METODOLOGI KAJIAN.....	28
3.1Pengenalan	28
3.2 Kerangka Konseptual	28-30
3.3 Hipotesis Kajian	30-31
3.4 Reka Bentuk Kajian	31
3.4 Definisi Operasi	32
3.4.1 Amalan Pengurusan Keselamatan	32

3.4.1.1 Komitmen Keselamatan	32
3.4.1.2 Latihan Keselamatan	32
3.5.1.3 Penglibatan Pekerja dalam Aspek Keselamatan	32
3.5.1.4 Komunikasi dan Maklumbalas dalam Keselamatan	32
3.5.1.5 Peraturan dan Polisi Keselamatan	32
3.5.1.6 Dasar Promosi Keselamatan	32
3.6 Pembolehubah dan Instrumentasi	33
3.6.1 Pembolehubah	33
3.6.2 Instrumentasi	34-35
3.6.3 Borang soal selidik	35-37
3.7 Populasi dan Pensampelan	37-38
3.8 Kaedah Pengumpulan Data	38
3.9 Kajian Rintis	39-40
3.10 Teknik Analisis Data	40-41
3.10.1 Data Screening	41
3.10.2 Normality	42
3.10.3 Ujian Hipotesis	42-43
3.11 Rumusan	43-44
BAB EMPAT DAPATAN KAJIAN DAN PERBINCANGAN.....	45
4.1 Pengenalan	45
4.2 Profil Demografi Responden	45

4.2.1 Analisis Frekuensi Profil Demografi Responden	45-53
4.3 Pemeriksaan Data	53
4.4 Analisis Deskriptif	60
4.5 Ujian Korelasi	62
4.6 Analisis Regresi	64
4.7 Analisis Hipotesis	65
4.8 Rumusan	66
 BAB LIMA KESIMPULAN DAN CADANGAN.....	 67
5.1 Pengenalan	67
5.2 Ringkasan kajian	67
5.3 Perbincangan Hasil Dapatan	68
5.3.1 Tingkahlaku	68
5.3.2 Amalan Pengurusan Keselamatan	69
5.3.3 Hubungan antara AMK dan Tingkahlaku keselamatan	69-73
5.4 Cadangan kepada organisasi	73
5.5 Cadangan Kajian Lanjutan	74
5.6 Limitasi kajian	75-76
5.7 Kesimpulan	76
 RUJUKAN.....	 77
LAMPIRAN	87

SENARAI JADUAL

JADUAL	TAJUK JADUAL	MUKA SURAT
Jadual 1.1	Bil. Kemalangan Pekerjaan dari Tahun 2001 hingga 2010	4
Jadual 1.2	Statistik Kemalangan Pekerjaan Mengikut Sektor	8
Jadual 3.1	Item-item di dalam borang soal selidik	36
Jadual 3.2	Bil. Edaran dan Kutipan Balik Borang Soal Selidik	38
Jadual 3.3	Nilai ‘Cronbach Alpha’ bagi dimensi instrumensi dalam kajian rintis.	40
Jadual 4.1	Analisis Normality Pemboleh Ubah Kajian	47
Jadual 4.2	Statistik Deskriptif	61
Jadual 4.3	Nilai Korelasi dan Kekuatan Hubungan	61

Jadual 4.4	Hubungan antara Amalan Pengurusan Keselamatan dan Tingkah Laku Selamat	62
Jadual 4.5	Kesan Amalan Pengurusan Keselamatan ke atas Tingkah Laku Selamat	63
Jadual 4.6	Rumusan Pengujian Hipotesis	64

SENARAI RAJAH

RAJAH	TAJUK RAJAH	MUKA SURAT
Rajah 3.1	Model Hipotesis (Vinodkumar & Bhasi, 2010)	29
Rajah 3.2	Kerangka Konseptual Kajian	30
Rajah 4.1	Histogram bagi Pemboleh Ubah Komitmen Pengurusan	48
Rajah 4.2	Histogram bagi Pemboleh Ubah Latihan Keselamatan	49
Rajah 4.3	Histogram bagi Pemboleh Ubah Penglibatan Pekerja dalam Keselamatan	49
Rajah 4.4	Histogram bagi Pemboleh Ubah Komunikasi dan Maklumbalas Keselamatan	50
Rajah 4.5	Histogram bagi Pemboleh Ubah Peraturan dan Prosedur Keselamatan	50
Rajah 4.6	Histogram bagi Pemboleh Ubah Dasar Promosi Keselamatan	51
Rajah 4.7	Histogram bagi Pemboleh Ubah Tingkah Laku Selamat	51
Rajah 4.8	Item Jantina	52

Rajah 4.9	Item Bangsa	53
Rajah 4.10	Item Umur	54
Rajah 4.11	Item Taraf Perkahwinan	55
Rajah 4.12	Item Pencapaian Akademik	56
Rajah 4.13	Item tempoh Perkhidmatan	57
Rajah 4.14	Item Status Pekerjaan	58

BAB 1

PENDAHULUAN

1.1 PENGENALAN

Isu berkaitan keselamatan pekerjaan kini semakin mendapat perhatian pelbagai pihak tidak kiralah dari orang awam, ahli akademik dan pengamal industri (Adams-Roy, Knap & Barling, 1995; Zacharatos, 2001). Banyak pihak mula membuka mata akan kepentingan isu ini. Beberapa malapetaka besar yang berlaku seperti bencana nuklear di Chernobyl, Ukraine (1986), 'Three Mile Island' (2009) dan juga kes kebocoran gas Methyl Isocyanate yang berlaku di Bhopal pada tahun 1984 telah memberikan kesedaran kepada semua pihak tentang kemungkinan yang akan berlaku sekiranya berlaku kelemahan dalam pengurusan keselamatan. Kesan yang akan ditinggalkan tidak hanya dapat dilihat pada mangsa, tetapi juga akan dikongsi bersama-sama generasi yang lain. Walaubagaimanapun, menurut Adams-Roy et al. (1995), kebanyakan pihak industri kini lebih melihat kesan yang akan berlaku terhadap persekitaran luar berbanding kesan yang akan berlaku kepada pekerja mereka. Pernyataan ini dapat menjawab persoalan tentang statistik kemalangan yang masih lagi meningkat di tempat kerja dan juga isu kurangnya kajian di dalam bidang pengurusan sains berkaitan keselamatan pekerjaan (McLain, 1995; Zacharatos, 2001; Chai, 2005).

The contents of
the thesis is for
internal user
only

RUJUKAN

- Adams-Roy, J. E., Knap, M. A., & Barling, J. (1995). Commitment to occupational health and safety in management training.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Bowander, B. (1987). The Bhopal accident. *Technological Forecasting and Social Change* 32 (2), 169–182.
- Chai, W. (2005). The impact of safety culture on safety performance: A case study of a construction company. A published doctoral dissertation thesis. Department of Instructional System Technology, Indiana University, USA.
- Chen, C.F., & Chen, S.C. (2014). Measuring the effects of Safety Management System practices, morality leadership and self-efficacy on pilots' safety behaviors: Safety motivation as a mediator. *Safety Science*, 62 (2014) 376–385.
- Cheyne, A., Cox, S., Oliver, A., & Tomás, J. M. (1998). Modelling safety climate in the prediction of levels of safety activity. *Work & Stress*, 12(3), 255-271.

Chouhan, T.R. (2005). The unfolding of Bhopal disaster. *Journal of Loss Prevention in the Process Industries*, 18 (4–6), 205–208.

Cohen, A. (1977). Factors in successful safety programs. *Journal of Safety Research* 9, 168–178.

Cohen, H. H., & Cleveland, R. J. (1983). Safety program practices in record-holding plants. *Professional Safety*, 28(3), 26-33.

Cohen, A., Smith, M., Cohen, H.H. (1975). Safety Program Practices in High Versus Low Accident Rate Companies. HEW Publication No. (NIOSH) 75-185. National Institute of Occupational Health and Safety, Cincinnati, OH.

Cooper, D. (1999). Behavioral Safety: A case study from ICI Autocolours, Stowmarket. *Management of Occupational Health, Safety and Environment*, 3, 10.

Cox, S. J., & Cheyne, A. J. T. (2000). Assessing safety culture in offshore environments. *Safety science*, 34(1), 111-129.

Cox, S., Flin, R. (1998). Safety culture: philosopher's stone or man of straw? *Work and Stress* 12 (3), 189–201.

Creswell, J. W. (2005). *Educational research: Planning, conducting and evaluating quantitative and qualitative Research*.

DePasquale, J.P., Geller, E. (1999). Critical success factors for behaviour based safety: a study of twenty industry-wide applications. *Journal of Safety Research* 30, 237–249.

Donald, I., Canter, D. (1994). Employees attitudes and safety in the chemical industry. *Journal of Loss Prevention in the Process Industries* 7, 203–208.

Dyer, W. G. (1994). Potential Contributions of Organizational Behavior to the Study of Family-Owned Businesses. *Family Business Review*, 7(2), 109-131.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.

Flin, R., Mearns, K., O'Connor, P., & Bryden, R. (2000). Measuring safety climate:

- identifying the common features. *Safety science*, 34(1), 177-192.
- Glendon, A. I., & Litherland, D. K. (2001). Safety climate factors, group differences and safety behaviour in road construction. *Safety science*, 39(3), 157-188.
- Hagan, P.E., Montgomery, J.F., O'Reilly, J.T. (2001). Accident Prevention Manual for Business and Industry, 12th ed. NSC, Illinois, USA.
- Hair, J. F., Tatham, R. L., Anderson, R. E., & Black, W. (2006). *Multivariate data analysis* (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall.
- Hair, J. F., Wolfinbarger, M. F., Ortinau, D. J., & Bush, R. P. (2010). *Essentials of marketing research*. McGraw-Hill/Irwin.
- Healey, M. (2005) Linking research and teaching: disciplinary spaces. In: R. Barnett (Ed.) *Reshaping the University: New Relationships between Research, Scholarship and Teaching*, 30-42. Maidenhead: McGraw-Hill/Open University Press.
- Garrett, R. B., & Perry, A. J. (1996). A safer way to move patients. *Occupational health & safety* (Waco, Tex.), 65(9), 60-1.

Geller, E.S. (2001). *The Psychology of safety handbooks*, Boca Raton, Florida: Lewis

Publisher.

Goetsch, D.L. (2005). *Occupational Health and Safety for Technologists, Engineers and*

Managers, 5th Ed. Prentice Hall.

Goodrum, P. M., & Gangwar, M. (2004). Safety incentives. A study of their effectiveness

in construction. *Professional Safety*, 49(7), 24–34.

Griffin, M.A., Neal, A. (2000). Perceptions of safety at work: a framework for linking

safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health and Psychology* 5, 347–358.

Griffiths, D.K. (1985). Safety attitudes of management. *Ergonomics* 28, 61–67.

Gupta, J.P. (2002). The Bhopal gas tragedy: could it have happened in a developed

country? *Journal of Loss Prevention in the Process Industries*, 15 (1), 1–4.

Harper, A.C., Cordery, J.L., de Klerk, N.H., Sevastos, P., Geelhoed, E., Gunson, C.,

Robinson, L., Sutherland, M., Osborn, D., Colquhoun, J. (1997). Curtin industrial

safety trial: managerial behavior and program effectiveness. *Safety Science* 24,

173–179.

Hinze, J. (2002). Safety incentives: do they reduce injuries? ASCE Practice

Periodical on Structures and Construction 7 (2), 81–84.

Hofmann, D., Jacobs, R., Landy, F. (1995). High reliability process industries: individual,

micro, and macro organizational influences on safety performance. *Journal*

of Safety Research. 26, 131–149.

Ivancevich, J.M. (1995). Human Resource Management. 6th Ed. Chicago: Irwin.

International Labor Organization, (2014). Dilayari pada 5 Mei 2014 di

<http://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm>

Kolvereid, L. (1996). Prediction of employment status choice intentions. *Working Paper Series-Henley Management College Hwp.*

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educ Psychol Meas.*

Krueger, R. A. (86). Casey. MA (2000). *Focus groups: A practical guide for applied research.*

Krueger, N.F. and Carsrud, A.L. (1993). Entrepreneurial intentions: Applying the theory of planned behaviour. *Entrepreneurship for Regional Development*, 5, 315-330.

Labodová, A. (2004). Implementing integrated management systems using a risk analysis based approach. *Journal of Cleaner Production*, 12(6), 571-580.

Majid, S. (2000). *Foundations of quantum group theory.* Cambridge university press.

Mars, G. (1996). Human factor failure and the comparative structure of jobs: the implications for risk management. *Journal of Managerial Psychology* 11, 4–11.

Mattson, M., Torbiörn, I & Hellgren, J. (2014). Effects of staff bonus systems on safety behavior. *Human Resource Review* 24. 17-30.

- Mearns, K., Whitaker, S. M., & Flin, R. (2003). Safety climate, safety management practice and safety performance in offshore environments. *Safety Science*, 41(8), 641-680.
- Melamed, S., Yekutieli, D., Froom, P., Kristal-Boneh, E., & Ribak, J. (1999). Adverse Work and Environmental Conditions Predict Occupational Injuries The Israeli Cardiovascular Occupational Risk Factors Determination in Israel (CORDIS) Study. *American journal of epidemiology*, 150(1), 18-26.
- Mohamed, S. (2003). Scorecard approach to benchmarking organizational safety culture in construction. *Journal of Construction Engineering Management*. 129 (1), 80–88.
- Neal, A., & Griffin, M. A. (1997, April). Perceptions of safety at work: Developing a model to link organizational safety climate and individual behavior. In *12th Annual Conference of the Society for Industrial and Organizational Psychology, St. Louis, MO*.
- Pidgeon, N. F. (1991). Safety culture and risk management in organizations. *Journal of cross-cultural psychology*, 22(1), 129-140.

Saidin Misnan & Abdul Hakim. (2007). Pembangunan Budaya Keselamatan dalam

Industri Pembinaan. *The Malaysian Surveyor*, 20-33.

Sekaran, U. (2000). Research Methods for Business; A skill business approach. *New York: JohnWiley and Sons*.

Shafai-Sahrai, Y. (1971). An Inquiry into Factors that Might Explain Differences in Occupational Accident Experience of Similar Size Firms in the Same Industry.

Division of Research, Graduate School of Business Administration, Michigan

State University, East Lansing, MI.

Shannon, H.S., Walters, V., Lewchuk, W., Richardson, J., Moran, L.A., Haines, T.,

Verma, D. (1996). Workplace organizational correlates of lost-time accident rates in manufacturing. *American Journal of Industrial Medicine* 29, 258–268.

Shannon, H., Mayr, J., Haines, T. (1997). Overview of the relationship between

organizational and workplace factors and injury rates. *Safety Science* 26, 201–217

Sherry, P. (1992). Peer involvement and behavioral safety: a case study. In: Paper at the Annual Meeting of the American Association of Railroads. Safety Conference 8, June, Little Rock, AR.

Smith, M.J., Cohen, H.H., Cohen, A., Cleveland, R.J. (1975). On-site observations of safety practices in plants with differential safety performance. In: National *Safety Congress Transactions*, vol. 12, National Safety Council, Chicago.

Tabachnick, B. G., & Fidell, L. S.(2007). Multivariate Statistics (5 th).

Talley, W.K., Jin, D., Kite-Powell, H. (2005). Determinants of crew injuries in vessel accidents. *Maritime Policy and Management* 32, 263–278.

Teo, E.A.L., Ling, F.Y.Y., Ong, D.S.Y. (2005). Fostering safe work behaviour in workers at construction sites. *Engineering, Construction and Architectural Management*. 12 (4), 410–422.

Vinodkumar, M. N., & Bhasi, M. (2010). Safety management practices and safety

- behaviour: Assessing the mediating role of safety knowledge and motivation. *Accident Analysis & Prevention*, 42(6), 2082-2093.
- Vredenburg, A. G. (2002). Organizational safety: which management practices are most effective in reducing employee injury rates?. *Journal of safety Research*, 33(2), 259-276.
- Wilpert, B. (1994). Industrial/organizational psychology and ergonomics toward more comprehensive work sciences. *Proceedings of the 12th Triennial Congress of the International Ergonomics Association*, 1, (37–40).
- Williamson, A. M., Feyer, A. M., Cairns, D., & Biancotti, D. (1997). The development of a measure of safety climate: the role of safety perceptions and attitudes. *Safety Science*, 25(1), 15-27.
- Zacharatos, A. (2001). An Organization and employee level investigation of the relationship between high performance work systems and workplace safety. A published doctoral dissertation, Queen's University Kingston, Ontario.
- Zohar, D. (1980). Safety climate in industrial organizations: theoretical and applied implications. *Journal of Applied Psychology*, 65, 96–102.